THE DENTAL PRACTITIONER

a monthly journal for the Practitioner and his Staff

VOL. IV, NO. 7 MARCH 1954

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The Dental Laboratories Section of the Surgical Instrument Manufacturers' Association

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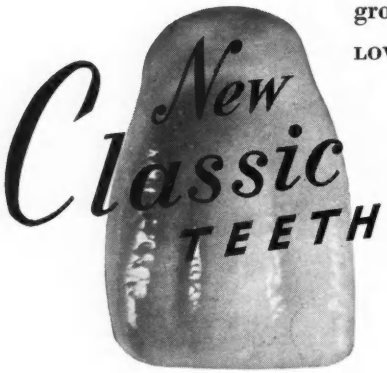

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Manuscript should preferably be typewritten with double spacing and wide margins, and the author should keep a copy. Articles and their illustrations become the property of *The Dental Practitioner*, unless authors reserve the right before publication.

Illustrations should be clearly numbered and legends should be written on a separate sheet of paper and not put on the backs of the originals. Each figure should be referred to in the text. Prints are preferred to X-ray negatives and should be on glossy paper. Lettering which is to appear on illustrations is best shown on an overlay or rough sketch. It should not be put on the original.

Tables should be typed on separate pages and each should have a caption which will explain the data without reference to the text.

References to dental literature should be recorded in the text, with the name of the author and the year of publication in parentheses. In the bibliography they should be arranged in alphabetical order in the following form, the abbreviations of periodicals being those adopted in the *World List of Scientific Periodicals*, e.g.:—

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THE
DENTAL PRACTITIONER
A Monthly Journal for the Practitioner and his Staff

Vol. IV, No. 7 March, 1954

EDITORIAL

DENTAL TECHNICIANS

THIS issue brings to an end the monthly supplement published for the Dental Laboratories Section of the Surgical Instruments Manufacturers' Association. There are regrets at the loss of the company that has lasted for two years, and the parting of S.I.M.A. is no exception. There must be on all occasions a close link between the dental surgeon and his technician based on an understanding of common problems. There are admittedly a number of dentists who do their own mechanics, but most of us in general practice are dependent upon the skill of a dental technician for much of our mechanical work. It was to further the ends of this close understanding between the practitioner and his technician that this journal decided to publish the transactions of S.I.M.A. together with articles on the various aspects of dental mechanics. However, with the passage of time more and more articles of a purely scientific nature were submitted for publication, and, with the decision to publish the transactions of the British Society for the Study of Orthodontics, it was announced that the journal would become one solely for the dental surgeon, and not as formerly for the dental practitioner and his staff. Changes are inevitable in a changing world and we should like in this their final supplement, to thank the Chairman of S.I.M.A. (Dental Section) and his editorial board for all their support during the past two years and wish them well for the future. We shall from time to time publish articles on prosthetic dentistry together with the technical procedures that go with this branch of dentistry, and trust that the interest of the technicians in this journal will be unchanged.

"LET'S KEEP OUR TEETH"
Foreign Versions

VERSIONS of "Let's Keep Our Teeth", a 20-minute technicolour film produced by D. & W Gibbs, Ltd., for the 1952 International Dental Congress, are now available in three other languages: Danish, Italian, and Swedish.

In addition to numerous showings in Great Britain, "Let's Keep Our Teeth" has recently been shown in France. Audiences were Congress members at the XXVIIes Journées Dentaires de Paris and fifth-year students of the Ecole Odontologique. In each instance the film was introduced by a representative of the Oral Hygiene Service.

NOTES ON DENTAL RADIOGRAPHY

I. PERIAPICAL FILMS

By **G. R. SEWARD**, M.D.S. (Lond.), F.D.S. R.C.S. (Eng.)

Demonstrator in Dental Radiology, The London Hospital Dental School

Introduction.—These notes are intended for persons having some small knowledge of dental radiographic technique who wish to extend their range of examinations in this area. Most of the principles mentioned have either been published or have been handed down from radiographer to radiographer; it has been thought worth while to gather them together in these notes.

Radiations.—It is thought appropriate that the question of precautions against the effects of radiation should be mentioned here. The operator of any X-ray apparatus, however "safe", should constantly have in mind the effects on his patient and on himself of the rays he is using.

In most dental equipment the output of the set and the anode–patient distance are fixed or indicated, and it seems to be accepted that with this 10 ma. 60–65 kvp. equipment at pointer cone distance, not more than 600 ma.-seconds' exposure should be given to the skin of the full mouth area in any short period of time. The milliampere-seconds are calculated by multiplying the milliampere output of the set (10 ma.) by the exposure time in seconds. If such an exposure is approached no further examination should be undertaken for at least fourteen days. Similarly not more than eight standard periapical films should be taken of one small region of the mouth without a similar interval of fourteen days elapsing (Lozier, 1950; Ingram, 1950).

When the anode–skin distance is shortened as in short-distance techniques for the condyle and temporomandibular joint, special care should be used. Not more than four, or possibly six, exposures (three on each side) should be made without a period of at least fourteen days being allowed to go by before further radiography is undertaken.

The operator himself should stand behind the tube, 6 ft. away from the patient, and on *no* account should he hold films in the patient's mouth.

General Remarks.—The variations in the shape of patients' jaws and the arrangement of their teeth make the application of hard-and-fast techniques impossible in dental radiography. An individual assessment must be made for each case. However, certain guiding principles can be laid down. These serve two purposes. Firstly, they enable beginners who have no background of experience to produce usable radiographs. Secondly, they enable variations to be made from a known standard method where this will not produce the result desired. Flexibility of ideas and methods will often produce the best results.

Periapical or Intra-oral Views.—The term "periapical" is preferable for these views as bite-wing and occlusal films are also placed intra-orally. It also indicates that the crowns of the teeth are not shown to advantage in these views.

The full mouth examination is commonly made on fourteen $1\frac{1}{4} \times 1\frac{5}{8}$ in. periapical films plus two bite-wing films—one periapical film with its long dimension horizontally for 876, one longways for 6543, one shortways for 432, and one shortways in the midline for 1|1, for both upper and lower (*see Fig.* 4). This arrangement of the film packets is indicated by the greater curvature of the arches in the anterior part of the mouth. Some authorities advocate the use of the $1\frac{1}{4} \times 1\frac{5}{8}$ in. film packet with its long axis horizontally in the edentulous incisor region. This wastes film, as the image is distorted towards the ends of the film owing to the excessive curvature resulting from its adaptation to the arch in this region. Two additional views covering 321| and |123 regions may be added with advantage, making sixteen periapical films.

The occlusal or incisal edge of the film should be a short distance beyond the teeth in the

upper and lower incisor regions and the lower molar region. This edge should lie a little farther beyond the teeth in the upper molar and premolar region and the lower premolar region. In the canine regions the occlusal margin of the film should be placed about 3 mm. farther occlusally at the premolar end, as the buccolingual width of the premolars is greater than the lateral incisors and the shadow of their buccal cups will be projected nearer the edge of the film (*Fig.* 1). This positioning of

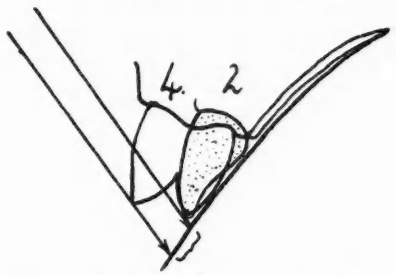

Fig. 1.—Illustrates the reason for the buccal cusp of the upper premolar being projected lower than the incisal edge of the lateral incisor in a periapical view of an upper canine.

the film packets produces an arrangement of the tooth images an even distance from the film edge.

One part of the film may appear darker than the other in the premolar, canine, and incisor region owing to the soft-tissue shadow of the lips. The patient should be asked to draw the lip over the packet, before the exposure is made, to obviate this.

The full mouth examination should be used where a repeated routine record of a patient's mouth is being made at regular intervals of time, where radiographs are being taken for a case of periodontal disease, or where a check is being made to see what parts of the jaws are affected by multiple lesions, etc. The views as taken for a full mouth survey must not be expected to give the ideal picture of all parts of the teeth and jaws covered by them. Additional periapical views may be needed to provide more information on conditions observed in the "full mouth" examination.

Where a single lesion is being radiographed the film should be specially positioned to show the whole lesion at once if this is possible. The standard film positions used for the region in question in a full mouth examination should not be employed if half the lesion will appear on one film and half on another.

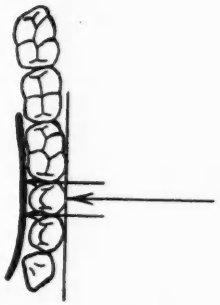

Fig. 2.—In the horizontal plane the central ray is directed at right angles to the tangent to that part of the arch where the tooth under investigation is situated. This enables the rays to pass through the interproximal spaces.

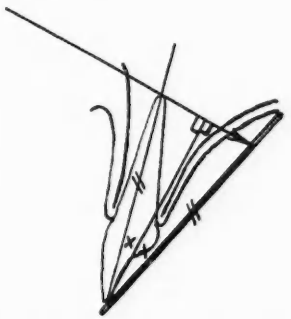

Fig. 3.—This diagram illustrates the rule of isometry. In the two triangles formed by the plane of the film, the plane of the tooth, the bisecting plane, and the path of the X rays through the apex there are: (1) two angles right angles, by construction; (2) two angles equal, by construction, angle bisected; (3) one side common to both triangles. The two triangles therefore are congruent and the image length equals the object length.

PRINCIPLES OF PERIAPICAL VIEW TECHNIQUE

1. *In the Horizontal Plane.*—The tube must be so set that the central ray will be at right angles to the tangent to that part of the arch where the tooth under examination is situated. (*Fig.* 2.)

2. *In the Vertical Plane.—The rule of isometry of Ciesynsky*: Bisect the angle formed by the mean plane of the film and the mean plane of the tooth, and direct the central ray perpendicular to the bisecting plane (*Fig.* 3).

The application of these principles will produce a sharp image of equal length to the object, but the image will not be a true lateral projection unless the planes of the film and tooth are parallel to one another.

If the mean occlusal plane of the jaw under examination is placed parallel with the ground the following angles apply (downward tilting of the cone is usually described as producing a positive angle; upwards tilting, a negative angle) (*Fig.* 4):—

	Upper jaw	*Lower jaw*
Incisors	+60	−30
Canines	+50	−20
Premolars	+40	−10
Molars	+30	0

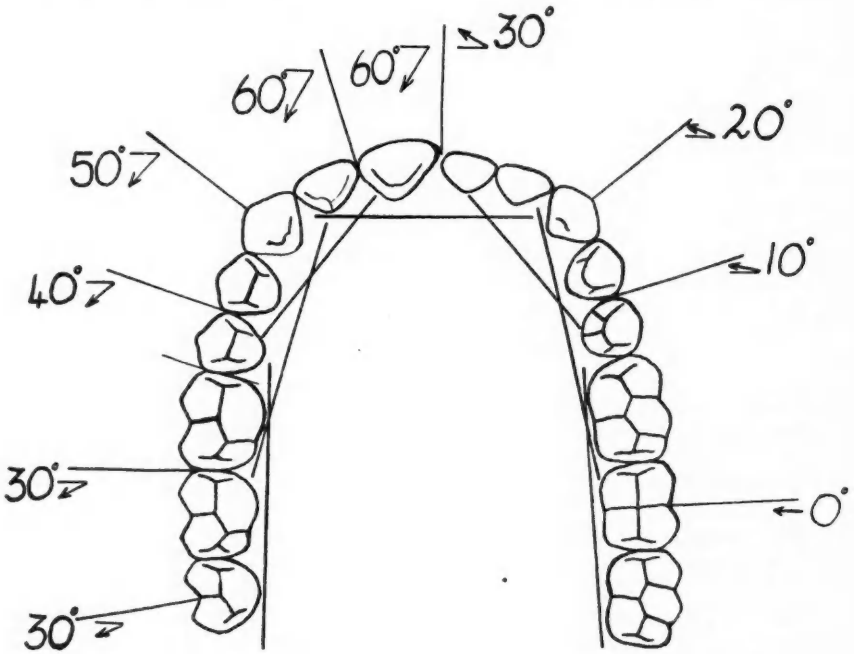

Fig. 4.—A diagram showing the angles used in making periapical radiographs; upper jaw on the left, lower jaw on the right. The short anterior three lines and the posterior four long lines, lingual to the teeth, illustrate the positions of the film packets.

THE VERTICAL ANGLE

In practice it is difficult, if not impossible, to judge the planes of the film and tooth and therefore to judge the bisecting plane and the angle required to direct the central ray at right angles to it. A system of average angles is therefore employed, or a variation by a known amount from the average angle where indicated.

Some confusion exists because some authorities appear to advocate angles differing markedly from those quoted above; this is owing to the use of different positionings of the head.

Exceptions to the Normal Vertical Angles.—1. *In the Adult with Teeth.*—As pointed out by C. O. Simpson (1928), the height of the vault of the palate is not a guide to variations in vertical angles. A shallow vault may be

due to a low alveolus containing short roots. A deep vault may conversely be due to a high alveolus and long roots. The normal angles may be correct in such cases. It is the angle of inclination of the axis of the teeth that is important. For example, an increased vertical angle is indicated for the more horizontally placed upper incisors of Angle's Class II, Division 1, and a decreased angle is appropriate for the vertical incisors of Class II, Division 2. Occasionally it is necessary to over-angulate in cases with shallow palates, not because the axes of the teeth require it, but in order to project the shadow of the periapical bone down onto the film. Abnormal swellings of the jaws may mean that the film must lie more horizontally. A higher angle is then necessary to fulfil the requirements of directing the central ray at right angles to the bisecting plane.

2. *In the Child.*—The normal angles are usually correct for the incisor regions and for radiographs of the deciduous teeth themselves. To include the developing adult dentition an increase in the angles for the canines, premolars, and molars of 5–10° is necessary according to the age of the patient, the greater angle being necessary for younger children.

The small periapical film, size $1 \times 1\frac{1}{4}$ in. should be used for young children.

3. Edentulous Mouths.—The angles are basically the same. If the ridges are high and the film can be placed nearly vertical a low angle can be employed. More commonly excessive resorption has produced a flat ridge, and the film will lie almost horizontally, necessitating a higher angle to obey the rule of isometry.

THE HORIZONTAL ANGLE

1. Posterior Teeth.—If a finger is laid in the buccal sulcus to represent the tangent to the arch, then the front edge of the square type tube case can be placed parallel with that finger. This will bring the central ray at right angles to the tangent.

2. Anterior Teeth.—An imaginary line is dropped down the centre of the long axis of the pointer cone on the side facing the operator. The tube head is manœuvred until this line coincides with the long axis of the tooth to be radiographed (*Fig.* 5).

SPECIAL CASES AND SPECIAL METHODS

1. The Lower Third Molar.—The requirements of a periapical view of the lower third molar, when it is intended to operate on this tooth, are:—

a. A sharp, undistorted image of the tooth.

b. A picture of the bone behind the tooth, below its apex and above the crown if deeply seated.

c. A clear view of the contact point of the third molar with the second molar and the space below it.

d. A view of the second molar with the buccal and lingual cusps superimposed.

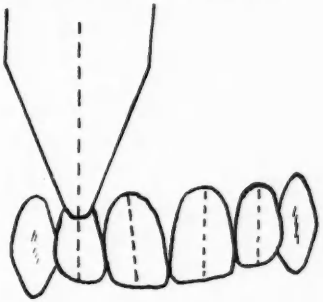

Fig. 5.—Shows the method for obtaining the correct horizontal angulation for anterior teeth by alining the long axis of the cone and the long axis of the tooth.

To attain these ends the following points should be observed:—

The vertical angle should be adjusted so that the central ray passes parallel to the occlusal plane of the second molar.

The third molar region should be inspected and palpated to determine whether the tooth is in the line of the arch, or buccal or lingual to it. If it is buccal, the central ray must be directed from slightly in front to get the interproximal space without overlap of contact points. If lingual the central ray must come from slightly behind (*Fig.* 6).

If the third molar is a long way buccal or lingual, this correction will distort the image of the tooth. In these cases two films are required, one for the tooth and one for the interproximal space.

For vertical, disto-angular, or slightly mesio-angular teeth the mesial edge of the film

should be not farther forwards than the mesial surface of the first molar.

For horizontal teeth the film should be pushed back until the mesial edge lies midway along the first molar. If it is not possible to pass the film back this far with the normal orientation of the packet, the method described by Richards (1952) should be used. (*Fig.* 7.)

It is important to remember with vertical and disto-angular impactions that their crowns,

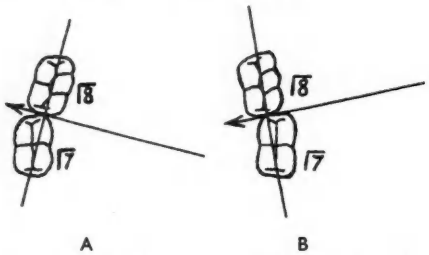

Fig. 6.—A, Shows the approach to a buccally placed left third molar. B, Shows the approach for one lingually placed.

under the soft tissues, may be at a higher level than the crown of the second molar, owing to the curve of Spee. The upper edge of the film should be tilted upwards at the back to allow for this. This point should be borne in mind when placing the film packet in film holders, especially those of the flanged Spencer-Wells type.

A closed-mouth technique using a film holder relaxes the floor of the mouth and enables the film to be placed more easily in small mouths.

The patient should be warned not to swallow during the exposure, as this displaces the film.

Retching is a serious nuisance in this region. The slow, steady introduction of the film with encouragement of the patient to relax the floor of the mouth, and the immediate exposure of the film once it is positioned, will help. Positioning of the tube and setting of the time switch should be done before placing the film. Breathing through the nose and biting on a film holder help to reduce the desire to retch. In extreme cases the mucosa of tongue and palate local to the film may be anæsthetized with lignocaine ointment.

2. The Upper Third Molar.—This tooth, if unerupted, is tucked up behind the second molar and usually inclined outwards and backwards. The central ray should be directed from slightly behind. It may be necessary to increase the vertical angulation, for some cases up to 65°, to get a sharp image down onto a film in the mouth.

3. The Incisor Region of Narrow Arches.—In these cases close adaptation of the film

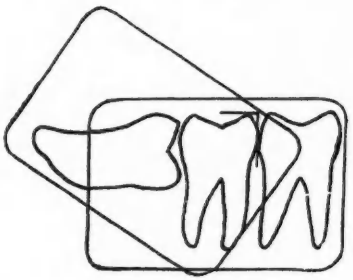

Fig. 7.—A diagram illustrating the placing of a film for a periapical view of a horizontally impacted third molar.

packet to the arch causes excessive bending and therefore distortion of the resulting image. Several methods will give an acceptable radiograph:—

a. Folding a periapical film packet longitudinally and so reducing its width. This is preferable to cutting the packet down as the folded film is stiffer and lies flatter.

b. Placing the film sufficiently far back in the mouth to pass between the teeth on either side of the arch without undue bending. A lower angulation may be possible and an increased anode-film distance is advisable as the object-film distance is increased.

c. Placing the film in the occlusal plane and increasing the angulation to 65° in the maxilla and 45° in the mandible (oblique occlusal view). This method is advocated by F. L. Ingram (1952).

4. Teeth lying obliquely to the Arch.—An occlusal film will of course show these teeth, but sometimes a periapical view will give valuable information.

The film packet, held in a pair of Spencer-Wells forceps, is placed across the arch so as

to be as near parallel to the long axis of the tooth as possible and in such a position that the image can be projected onto the film (*Fig.* 8).

The central ray is projected at right angles to the mean long axis of the film and tooth. An increased anode-film distance is required.

5. The Upper Molar Region.—The shadow of the zygomatic arch may cause diagnostic difficulties by obscuring the region of the apices of the molar roots in periapical radiographs. Le Masters' technique is designed to provide a periapical view with the zygomatic shadow thrown above the apices of the molar roots.

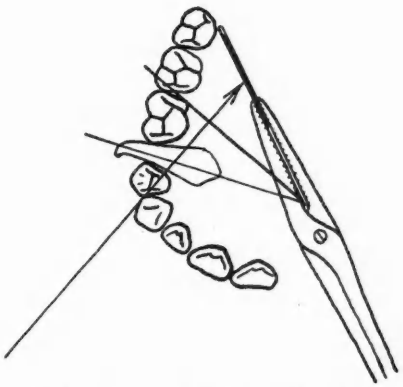

Fig. 8.—A diagram showing a method of obtaining a periapical view of a tooth transverse to the arch. The results are best with this method when the tooth is fairly high up.

If the film is supported more nearly parallel to the plane of the teeth a lower angulation than usual may be employed. About 10–15° is adequate with this technique. (*Fig.* 9.)

The film may be supported in two ways:—

a. Place a loop of linen around a cotton-wool roll and clamp the roll onto a film with a pair of Spencer-Wells forceps, using the linen loop ends. The roll supports the film away from the teeth and fills in the space between film and tooth.

b. Place a piece of rubber tubing over the joints of a pair of Spencer-Wells forceps and grip a film in the jaws. The film is placed up in the vault of the palate and positioned parallel to the plane of the teeth. It is maintained in position by allowing the patient to bite on the rubber tubing with the incisors.

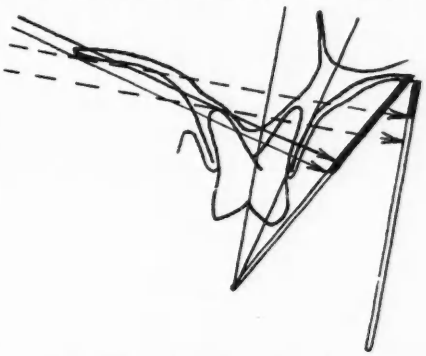

Fig. 9.—Shows how the shadow of the zygoma can be thrown clear of the apices of the molar teeth by a low angulation method. Solid arrows show direction of rays in the normal projection, dotted arrows show the direction of the rays with the low angulation method.

As the object-film distance is increased by this technique, an increased anode-film distance should be employed.

Fig. 10.—The method of demonstrating the two root canals of the upper first premolar.

6. Views of the Roots of Multi-rooted Teeth.—

a. Upper First Pre-molars.—The film packet is placed in the normal manner for the upper premolars, or slightly separated from the tissues mesially so as partly to stand across the arch.

The tube is centred as for the upper lateral incisor, then displaced sideways, so that the central ray passes through the premolar roots obliquely. Increased anode-film distance should be used. (*Fig.* 10.)

the mesio-buccal root. The palatal and distal roots will be thrown distally. (*Fig.* 11 A.)

2. A second film as in (1), but with the central ray coming from slightly in front. This will show the disto-buccal root. (*Fig.* 11 B.)

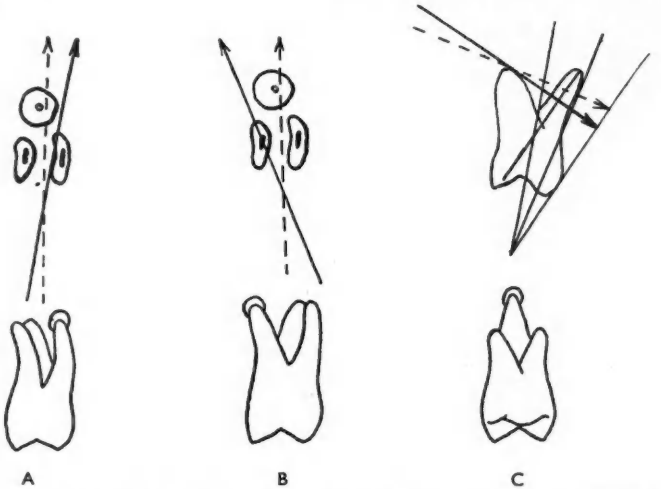

Fig. 11.—Illustrates the method of radiographing each root of an upper molar separately. Radiographs taken for (A) the mesial root, (B) the distal root, (C) the palatal root. The dotted arrows show normal direction of rays, the solid arrows the direction used in this method.

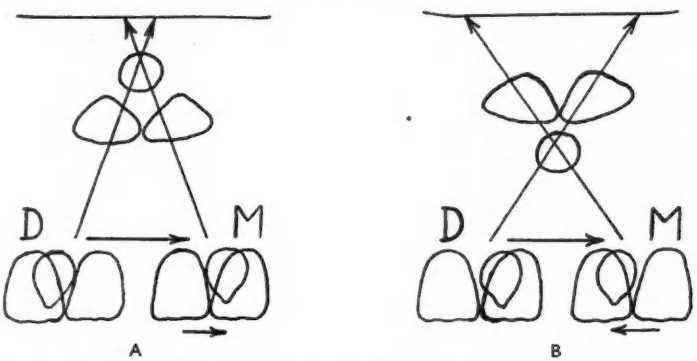

Fig. 12.—Shows the shifting of the image to be expected with the parallax method of determining whether a tooth is (A) palatal to the arch or (B) labial to the arch.

b. Upper Molars.—Take three films in the following manner:—

1. One film with the tube at normal vertical angulation (20–30°), but aiming the central ray from slightly behind the tooth. This will show

3. A third film with normal horizontal angulation, but with a vertical angle of 60°. This will foreshorten the buccal roots and sharpen the image of the palatine root. (*Fig.* 11 C.) (Case and Osgood, 1929.)

7. Parallax.—With this method the relationship of teeth to one another and to the line of the arch can be worked out.

Two films are exposed. If the film packet is marked heavily at a lower corner in lead pencil, the mark will be radiographed on to the film and identification of the film and the tube shift used will be possible. For example, when the tube lies distal to the normal position, mark the packet with a D, when mesial with an M. The two films are placed, one at a time, in the normal position for the area under examination. Place the first film marked with a D in position and place the tube in the usual manner for a periapical view of the region. Next move the tube 1–2 in. distally and re-angulate in the horizontal plane to centre on the film. Make the exposure and remove the film from the mouth.

Insert the second film, marked with an M, in the same place as the first film. Move the tube to a position 1–2 in. mesial to the normal position for a periapical view. Re-angulate in the horizontal plane as before and expose the film.

If the tooth examined lies buccal to the related teeth it will appear to have moved in relationship to them in the opposite direction to the tube. If palatal to the related teeth it will have moved with the tube. (*Fig.* 12.)

The method can be applied using a vertical shift, as suggested by Ciesynsky. Periapical and occlusal views are taken for this.

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EVOLUTIONARY TRENDS IN ORTHODONTICS: PAST, PRESENT, AND FUTURE

TWENTY-FIVE years of effort have proved that normal occlusion and the ultimate in facial balance are possible for few orthodontic patients. For the majority of patients, because of insurmountable limitations within the individual, orthodontists can strive only for as near an approach to normal in dental relationships and facial balance as conditions allow.

In order to gain balance and harmony of facial lines, it is necessary—throughout treatment—to place and retain the mandibular incisors within a ± 5-degree variation of the inclination of the mandibular incisors. It is difficult to maintain this position without resorting to the removal of teeth. In some instances, this objective can be achieved by over-expansion of the dental arches, but too often this is done at the expense of impacting both unerupted second and third molars. The usual aftermath to such overexpansion is relapse when retention is discontinued, and lasting damage to investing tissues.

As a result of the experience which was gained during the practice analysis and the study of the facial æsthetics in normal patients, the author developed his own concept of the normal. Nevertheless, he was unable to carry out his concept in treatment procedures, and was forced into the decision to extract certain teeth, just at the time when he was beginning to feel—for the first time—that progress was being made in treatment problems, and that patients, their parents, and the family dentists were approving the end-results that were attained.

There have been great changes in orthodontic thinking because of the excellent research which has been carried on during the past 15 years. Not until clinical orthodontists direct their energies and techniques along the lines which are dictated by modern proved research, will there be less harsh mechanics and more applied biology in the art of clinical orthodontics.—TWEED, C. H. (1953), *Amer. J. Orthodont.*, **39**, 81.

THE ORTHODONTIC PROBLEM*

By **W. TREVOR JOHNSON**, L.D.S. R.C.S. (Eng).

(*Continued from page* 177)

[THE following are a further selection from the cases shown by the President.]

Fig. 5.—Male at 10 yr. 6 mth. and 11 yr. This case is of interest as the advice given this parent by two orthodontists differed completely.

The occlusion is a full cusp post-normal bilaterally $\frac{3\,3}{3|}$ are *shut* out of the arch. The arches are small and the bite close, but the lower incisors meet the neck of the upper incisors and are not in contact with the *mucosa*. The patient is still wearing appliances.

The first opinion was influenced by the wish of the parent and the referring dentist that extractions be avoided. A long course of treatment was advised. The second opinion was that $\frac{4|4}{4|}$ be extracted and plates used to move $\frac{3|3}{3|}$ into the line of the arches. The second treatment will produce good alinement of teeth and occlusion, and it would not be possible permanently to correct the irregularity without extractions. As two units have been removed in the upper and only one in the lower, it is thought that the close bite will, with natural development, be reduced rather than increased.

DISCUSSION

Mr. H. Chapman thanked the President for his lucid address and for his invitation to open the discussion. He had spoken of the aetiological factor, current practice, and his own views on treatment in such an unequivocal manner as to disarm criticism, so remarks bearing on the questions propounded were based on thoughts on cases called to mind by the President's eminently practical paper.

He agreed with the President when he said that Class III cases gave the most satisfactory results, particularly when the treatment was commenced early.

A decision as to extraction in various types of cases seemed to present difficulties at times, whereas this should not be so. Recently he

*Presidential address given at the January meeting of the British Society for the Study of Orthodontics.

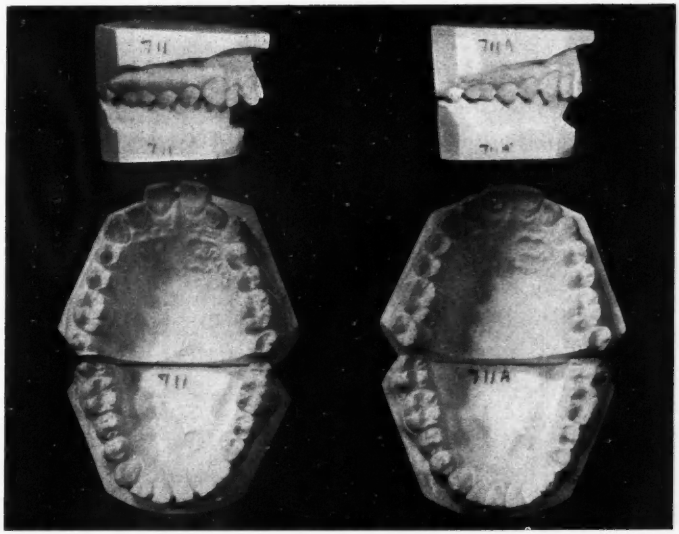

Fig. 6.—Male at 13 yr. and 16 yr. 2 mth. Angle Class II, div. 1. The post-normality is a full cusp and bilateral. There is a close bite and marked inclination of the upper and lower incisors. The patient's tongue is very long.

Treatment: By fixed appliances, firstly with reverse intermaxillary traction to close the lower incisor gaps by moving them lingually, and secondly with Class II elastics to change the relationship of the arches and move the upper incisors lingually. The lower incisors were very inclined to space again immediately, and very stern measures were necessary to prevent this until correct relationship of the arches was achieved.

Relapse was feared owing to the tongue, but seen two years after all appliances had been discarded the improvement is still maintained. A monobloc was worn for a year after all fixed appliances were removed.

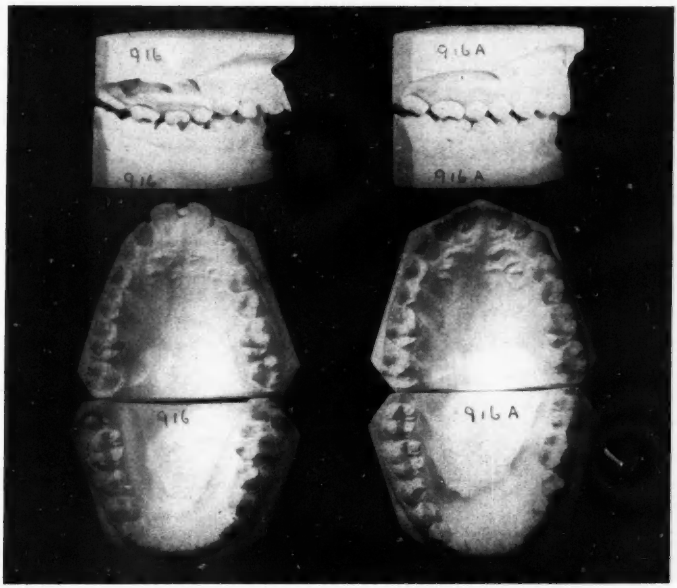

Fig. 7.—Male at 11 yr. and 15 yr. 2 mth. Angle Class II, div. 1.
Treatment: Fixed appliances and Class II elastics. Response was ready and final occlusion almost ideal.

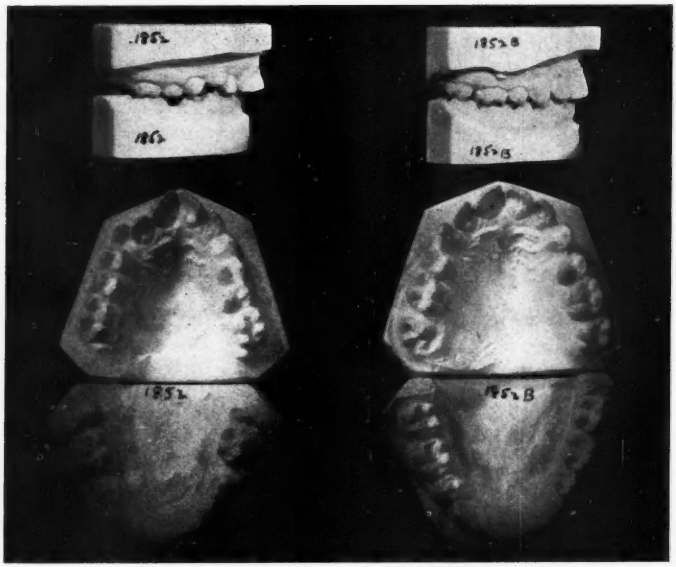

Fig. 8.—Female at 11 yr. and 13 yr. Angle Class II, div. 1. The post-normality is a full cusp and $\overline{21|12}$ bite hard on the mucosa at the necks of the upper incisors. Space lost in lower is more than can be regained.

Treatment: Extraction of $\frac{4|4}{4|4}$ and fixed appliances and intermaxillary traction followed by monobloc. No special provision in design of appliance was made to close spaces or rotate the incisors. It is thought that there is still time for the gaps in the upper to close. If four premolars had been extracted and no change in relationship of arches had been induced, no improvement in the close bite would have taken place.

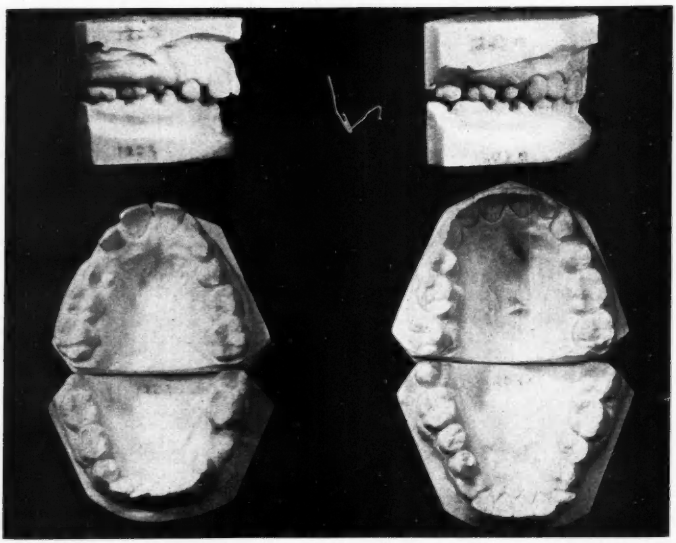

Fig. 9.—Female at 10 yr. 4 mth., and 14 yr. Angle Class II, div. 1. This is a skeletal Class II in which great difficulty has been experienced in getting a result. The lip posture was very unfavourable and great difficulty was experienced in finding room for the lower incisors. Here again a lower central incisor should have been extracted.

Treatment: Two years were spent in gaining space in the lower cheek teeth areas. Then intermaxillary traction was used for six months to move $\overline{21|12}$ lingually and change the relationship of the arches. As there was no response $\overline{4|4}$ were extracted, $\overline{321|123}$ banded, and $\overline{3|3}$ moved distally with intermaxillary elastics; then $\overline{21|12}$ were moved lingually and a monobloc was fitted.

The upper incisors are not sufficiently labially inclined, but it is possible that no better result than this can be achieved in some skeletal II cases. It is possible that relapse is more likely in this type of case than it is in cases which respond readily to change in relationship of the arches without excessive uprighting of the upper incisors.

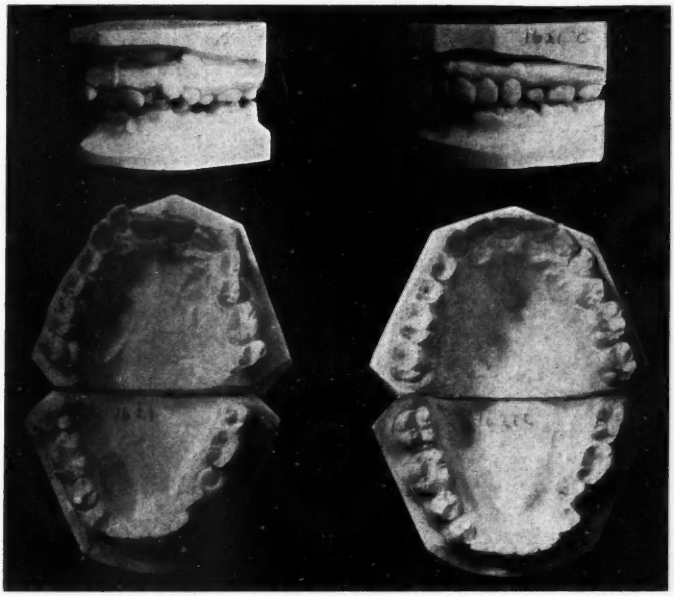

Fig. 10.—Female at 14 yr. 5 mth. and 16 yr. 7 mth. $\overline{3}|\overline{3}$ were either absent or were extracted. The occlusion is probably nearer normal with a tendency to Class II, div. 2, but the lower arch is collapsed, which gives the appearance of Clsss II, div. 2.

Treatment: (*a*) Extraction of $|\underline{4}$ and plate fitted to move $|\underline{2}$ distally and then $1|12$ labially; (*b*) Lower fixed appliance and an upper plate to carry hoops in the canine region for intermaxillary elastics. The impaction of $|\underline{5}$ is a defect, but by measurement there never was enough room for $|\underline{45}$, and with $|\overline{7}$ erupted it is difficult to increase the space for it.

In a plate of this type the use of the Adams pattern of crib on an incisor has been found to be a very valuable aid in retention. The cusps of the cheek teeth (or perhaps the lingual cusps only) are covered by a thickness of acrylic resin sufficient to protect the cribs, and this opening provides sufficient space to carry the crib over the tips of all incisors. The tips of the incisors are covered to prevent any elongation of the cribbed incisor and when the plate is fitted the acrylic resin covering the teeth is trimmed to give the patient an even bite in function. The patient seems to find no inconvenience from this gagging and if any depression of teeth takes place from the increased height of the bite, this quickly rights itself when the appliance is removed. This crib on an incisor is also very useful for lower plates when cheek teeth are not very suitable, and particularly so for retention plates which the patient is inclined not to push right home. The same precaution of covering the tip of the incisor cribbed is necessary.

Fig. 11.—Female at 11 yr., 14 yr., and 15 yr. 5 mth. This is an example of a true Class III malocclusion and the relapse which will take place if a vertical over-bite of the upper incisors over the lower incisors does not develop in the course of treatment. Treatment was by fixed appliances and reverse intermaxillary traction.

had seen a report of a case where the upper incisors were lingual to the lower incisors, in which two lower premolars were removed from a perfect lower arch. The decision to do this was based on cephalometric findings. He doubted if the extractions were beneficial. Extraction seemed uncalled for, even detrimental, where there was room for all the teeth; sometimes crowding was preferable to extraction.

The effect of habit was transitory. He had seen a considerable open bite, say 5 mm. in the incisor region, change to one of close bite in a year from age 9 yr. 4 mth. to 10 yr. 4 mth. without any treatment except cessation of the habit. Might not the effect of other habits disappear in similar circumstances? The President had referred to the fact that the atypical swallow may be seen in children with arches of normal size, so it seemed that this habit (if such it is) was not necessarily a cause of malocclusion. It was important that the orthodontist should know what was self-correcting, and, also, was aware of those changes associated with normal development which at some stages may be mistaken for abnormalities: he had seen such cases under treatment unnecessarily, sometimes for long periods. One was, except for the effects of thumb-sucking, probably a nice example of normal occlusion which, the habit having ceased, would have resolved itself, but after long treatment was being effectually prevented from doing so by an appliance.

The President had asked two questions: "How much and what sort of orthodontics should be practised?" and "Can the amount of treatment demanded be reduced by preventing the development of malocclusion or by starting treatment earlier?" There was no one answer to these. That a genetic (or congenital) condition could be prevented seemed beyond our powers, but there was probably an optimum time for treatment.

Environmental (and local) causes were in a different category. It should be possible to eliminate these or to counteract them, e.g., habits and premature loss of teeth. One preventive he rated highly in this connexion was the diet advocated by J. Sim Wallace fifty years ago; it developed good masticatory habits and a clean mouth—in the President's words it provided the best physical and chemical contacts. It was regrettable that his teachings, simple and practical, were so rarely referred to; they could be introduced into every home immediately even more readily in these days when fruit was available all the year round. A pamphlet, *Prevention of Caries*, which enumerated his tenets, had been published.

In conclusion Mr. Chapman said that each case must be judged individually. Treatment should consider the future welfare of the dental tissues—i.e., it should be as short and simple as circumstances permitted; he would answer the President's questions thus: The amount of treatment could be reduced by:—

1. Prevention of caries.

2. Prevention of malocclusion as a result of caries and premature loss of teeth.

3. Avoiding unnecessary treatment, e.g., cases in a developmental stage which was not an abnormality, and the apparent irregularity would disappear in the course of time.

4. Avoiding errors of treatment, e.g.: (*a*) cases which would be self-correcting when a habit ceased; (*b*) due to faulty diagnosis, prognosis, or treatment.

5. Treatment at the optimum age, i.e., at the earliest age for the particular case.

6. Simple treatment in preference to prolonged, difficult treatment. (If post-normal occlusion could be corrected in the deciduous dentition and as simply as pre-normal occlusion, that would be a great simplification.)

7. Utmost efficiency of appliances.

8. Not undertaking treatment when the prognosis and other factors were unfavourable.

Finally, Adamson's comment should be remembered, that "preventable malocclusion is being created daily".

Mr. H. G. Watkin said he was glad to hear the President say that he did not generally advise expansion, as no expansion greater than what would occur naturally would be maintained.

The President spoke of extracting a lower central incisor. Personally he considered it

important to avoid extraction of any lower incisors as it might lead to imbrication of the upper incisors later. He considered that the extraction of two units was necessary from the upper jaw to balance the extraction of one lower incisor.

Mr. H. E. Wilson asked if the President had any proof for his statement that atypical swallows were inherited. So far as he knew, this theory had not been proved. He agreed that Class III cases should be treated early, but thought this also applied to Class II, provided that a suitable appliance could be inserted early enough. He knew that it was now believed that treatment could not alter the apical base relationship, but thought this was still in doubt. Ricketts, in America, when working on the relationship of the condyle and fossa before and after Class II treatments, had found that before treatment the condyle was more downwards on the ementia than was normal and moved upwards and backwards when the mandible moved from the resting to the occlusal position, but that after treatment the position and movement was comparable to normal. Ricketts considered that this proved there was no growth of the condyle, but he himself regarded it as proof that there was such growth; and if so, there was every indication for early treatment of Class II cases. In fact the earlier the start, the better the prognosis.

The President said, in answer to Mr. Chapman's question, that in Class II, div. II, cases there was no reason for moving an upper incisor labially other than the bringing forward of the mandible.

With regard to the extraction of lower incisors, he extracted them in some cases. He thought it would be agreed that if three incisors were straight and the fourth crooked, the fourth could be removed and the space would close and the others remain straight; but if all four incisors were irregular, the removal of one would not as a rule help the rest to straighten. Years ago, one of Colyer's stock treatments was to extract a lower incisor and two upper 4s.

Regarding early treatment of Class II cases, this had not been his practice; but he thought Mr. Wilson may have had more experience than he had had. He did not feel he could help by discussing the subject as he had not read Rickett's work, but felt sure that members would benefit from Mr. Wilson's remarks.

Mr. P. G. Oliver (Croydon), in proposing a vote of thanks to the President, said that as one of the elder statesmen in orthodontics, Mr. Trevor Johnson had shown that he was not afraid of breaking a few rules, and he thought other orthodontists, as they grew older, might tend to do so too. The President had shown that very good results could be obtained by so doing. He agreed that when making a provisional diagnosis and working out a line of treatment, orthodontists should consider the length of treatment as a whole. Children from 11–16 years of age had heavy calls on their time, and he thought that if a 95 per cent rather than a 100 per cent result could be obtained by some reduction in the length of treatment, it was to the good.

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DISCOLOURED HYPOPLASTIC TEETH

THIS condition has been described under a variety of headings, and appears to have the characteristic deviation from the normal formation of the tooth structures, with transmission of malformation to succeeding generations. It is a debatable point whether this is a condition of a disturbance of formation or a disturbance of calcification. A case report is presented wherein both the deciduous and permanent teeth presented the condition of discoloured hypoplasia and the pathological report states that the defect may be associated with some constitutional disturbance of the enamel-forming cells.

Time alone will prove if this patient is to be the beginning of another generation that may yet inherit discoloured hypoplasia of teeth.—SOIFER, M. E. (1953), *Oral Surg.*, **6**, 886.

THE MORPHOLOGY OF THE LIPS IN RELATION TO THE INCISOR TEETH

A PRELIMINARY REPORT*

By W. A. NICOL, L.D.S., D.D.O.

Of the factors influencing the position of teeth, much study has been devoted to the morphology of the jaws and their relation one to the other (Broadbent, 1937; Brodie, 1950, 1952; and others). Considerable notice has been taken of the effect of muscles surrounding the teeth, and in particular the way in which they function or fail to function, or have perverted function (Ballard, 1948, 1953; Gwynne Evans, 1948; Rix, 1946). The morphological aspect of the environmental muscles of the teeth has received scant attention.

It has been recognized for some time that a small or large tongue has an influence on the form of the dental arch. The conditions have even acquired the special names of microglossia and macroglossia. The lips and cheeks are also subject to considerable variation. Lightoller (1925–6) describes great variation in the size and form of the muscles forming the lips, and as orthodontists we speak of a patient having a short upper lip, without having a very accurate idea of what consequences this may have.

For the purposes of this short communication it is proposed to look more closely at the effects of variation in lip form on the incisors and, in particular, the relation which the lip line bears to the level of the incisor teeth.

The only reference that can be found on the relation of the lip line to the incisor teeth is by A. G. Brodie (1950), who says, "The lip line may vary from the level of the incisal edges of the upper teeth to well above their gingival margins and it thus becomes apparent that it is the lower lip that controls the upper teeth".

The relationship is obviously governed by the inherent morphology of the lips, and the occlusal level of the incisor teeth.

As a result of work carried out by J. R. Thompson (1946) and others, it has been shown that the occlusal level of the upper incisors is controlled by the muscular activity of the muscles of mastication on the mandible together with the normal vertical development of the jaws and normal occlusion of the teeth, upper with lower. Where the occlusion is abnormal, the incisors tend to continue vertical movement accompanied by their supporting structures until stopped—usually by some soft tissue (the lip in the case of upper incisors). When such upper incisors move downward they come under the influence of an altered environment. They come under the control of a greater depth of lower lip. By the anatomical shape of the inner surface of the lower lip alone, these incisors tend to be tilted lingually (*Fig.* 1); that is, without any

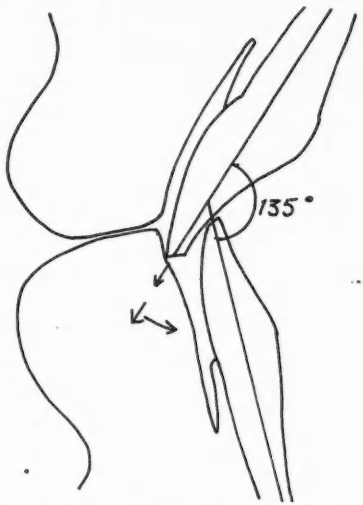


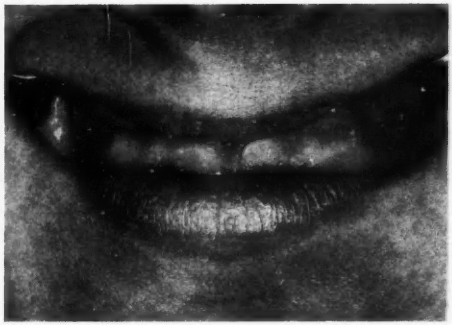
Fig. 1.—Incisors at Down's mean angle of 135° to each other, and lips drawn so that the lower lip just covers the incisal edge of the upper incisor.

* Short communication presented to the British Society for the Study of Orthodontics at the meeting held on Jan. 5, 1954.

increase in muscular activity and without any change of posture of the lower lip.

This effect on upper incisors may be brought about where there is a short upper lip and the upper incisors are at a normal vertical height. They will be tilted lingually by the lower lip.

A



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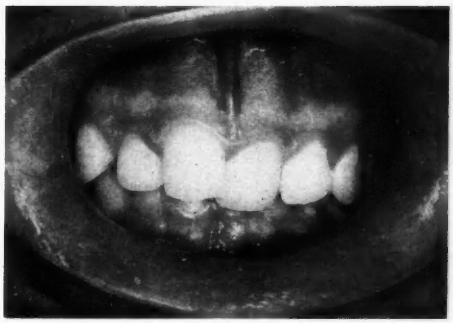


C

Fig. 2.—A, Lips in normal resting position. No variation from normal of either morphology or behaviour pattern. B, Upper lip lifted aside to show how lower lip covers the whole labial surface of the upper incisors. C, The same case showing deep overbite and imbrication of upper incisors.

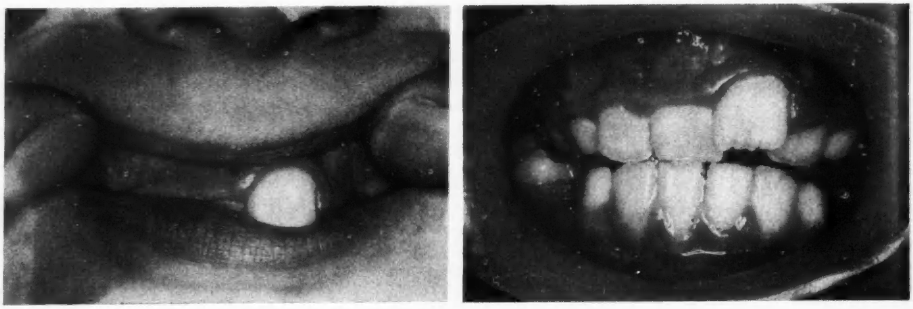
A study has been made of the relative position of the lip line in 16 cases of deep incisor overbite. In no case did the lower lip cover less than half of the labial surfaces of the clinical crowns of the upper incisors, and in several cases it covered all of the labial surfaces of the upper incisors (*Fig.* 2, A, B, C). In two cases of deep overbite one upper central incisor had escaped control by the lower lip and had erupted outside it. In each case the level of this central incisor was much higher than its fellow of the opposite side (*Fig.* 3, A, B).

The method of study was to lift away the upper lip in such a way as to cause the least possible amount of distortion of the lower lip and thereby ascertain the level of the lower lip in relation to the incisors. With practice this can be done without much alteration in the level of the lower lip. However, study of the lower lip line by the use of profile X-rays offers a method of greater accuracy. The general X-ray shadow of the lips may give a mistaken impression of their level at the midline unless the significance of the small triangular shadow seen in *Fig.* 4, A is realized. In *Fig.* 4, B an X-ray of the same patient is shown with radio-opaque paste painted on the midline of the lips. It will be seen from this that the small triangular area is in fact the junction of upper and lower lips in the midline. The use of radio-opaque paste in profile X-rays seems to offer the best method of study.

For the future much has yet to be studied and observed. The shape of the lip line as viewed from the front could have an effect on the incisor position. A lip line simulating an inverted "V" would bring a much greater depth of lower lip to bear on the central incisors than the lateral incisors. While the central incisors would be tilted lingually the laterals would be

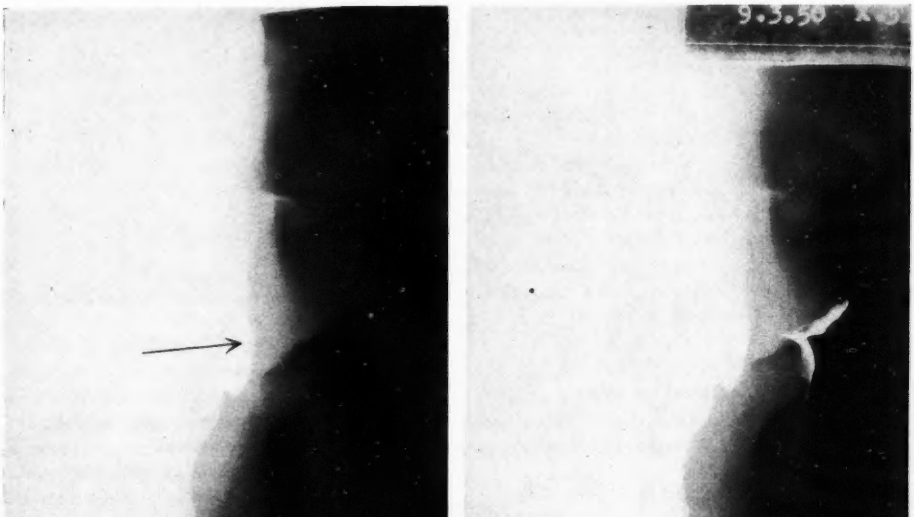
allowed to escape labially, producing the Angle's Class II division 2 type of incisor formation.

With further investigation we may find that muscle morphology goes hand in hand with skeletal morphology and neuromuscular behaviour patterns, forming syndromes which produce the common types of malocclusion familar to us all. With further knowledge of the morphology of the environmental muscles



A B

Fig. 3.—**A**, Upper lip lifted aside to show $\underline{1}|$ controlled by lower lip and $|\underline{1}$ escaped control. **B**, The same case showing difference in vertical height of $\underline{1}|\underline{1}$.



A B

Fig. 4.—**A**, Profile X-ray of soft tissue. Arrow indicates triangular shadow which is junction of upper and lower lip in midline. **B**, The same case with radio-opaque paste on the lips in the midline.

of the teeth and jaws we may find that we are able to fit yet another piece to the puzzle of orthodontic diagnosis, and have a clearer picture of the total problem we face.

I am indebted to Mr. C. F. Ballard, Professor A. I. Darling, and Mr. W. Trevor Johnson for encouragement and advice in the preparation of this paper, and to the University of Bristol Medical Photography Department for the photographs.

DISCUSSION

Mr. R. E. Rix congratulated Mr. Nicol on his report on an aspect of the problem of the environment of the incisors which needs a great deal more investigation and study.

He referred to a case known to Professor Rushton, of a child growing up without an upper lip. He did not recall the pathology of the case, but the fact that the relationship of the upper to the lower incisors was normal confirmed Mr. Nicol's statement that the lower lip influenced the relationship of the upper to the lower incisors and the position of the upper incisors.

He had always been doubtful about the influences which controlled the degree to which the upper incisors erupted, and was not convinced that the lips had any influence on their occlusal rise. He thought that the occlusal rise of the lower incisors was controlled by the immediate anteroposterior relationship of the upper and lower incisors, but did not know whether certain conditions fostered increased rise of the upper incisors.

He thought the examples given by Mr. Nicol, in which one central incisor had escaped from the lower lip and was then said to be shorter than the corresponding central incisor, could be explained by the degree of inclination. If room was made for that tooth to be retracted and alined with the corresponding central incisor, and it was retracted quickly, there would be no difference in level.

Mr. H. G. Watkin agreed with Mr. Nicol that the lips had a great influence on the teeth; the fact that orthodontists used an oral screen for the treatment of a case such as Mr. Nicol had shown, almost proved this. The pressure from the lips was concentrated on the outstanding incisor. Mr. Rix had said that if there was room the tooth would go back quite easily, but whether it stayed back depended on the inclination. If the apex of the tooth was so far backwards that the incline remained and the lower lip might still catch the upper incisor, it would not stay back. If an appliance was used and the tooth oscillated so that the apex came forward and the incisor was well in line, it would probably stay back.

Mr. W. J. Tulley asked whether Mr. Nicol had studied the familial aspect of the subject.

Mr. Nicol, in replying to the discussion, referred to Mr. Rix's point about the lack of an upper lip. He said it had occurred to him to try to look for cases with a cleft of the lip without a cleft of the alveolus. As to Mr. Rix's remarks about the difference in level, the point he had tried to make was that where there was an increase in the height of the upper incisors, the teeth must be tilted lingually. The reason he had shown the two cases, in which one incisor was tilted lingually and one had escaped forward, was to show that it was not the one forward which was at the wrong level, but that the one lingually inclined had moved farther down and had produced a deep over-bite of the incisors. Mr. Nicol said that he had not studied the familial pattern, but might do so in the future.

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PARLIAMENTARY NEWS

LABELLING OF CARBONATED DRINKS

In the Commons on the motion for the adjournment Dr. Barnett Stross (Lab., Stoke-on-Trent, C.), calling attention to carbonated drinks, said that an experiment in America showed that after two days' immersion in coca cola human teeth became very soft. He had proved it himself and could show the Minister the specimen. He asked the Minister of Food to insist that the formula should be put on the label. "We ought to know how much sugar there is in these drinks—all of them."

Dr. Charles Hill (Parlimentary Secretary, Ministry of Food) replying, said that had the molars been immersed not in cola but in fresh lemon juice they would have lost 35 per cent of their weight. Even in the Ministry of Food's orange juice they would have lost weight. "Experiments under these conditions have little value in determining the fortitude of the teeth or the power of the solution." (Laughter.)

He did not exclude the possibility of labelling. The Food Standards Committee would consider this whole range of drinks, but that was no sign that frightful dangers existed in the drinking of such fluids. This particular class of drink seemed to be in company with other very reasonable types of food. (*F., Feb.* 5)

THE PROCEEDINGS OF THE BRITISH SOCIETY OF PERIODONTOLOGY

President: A. FRANK STAMMERS, M.D.S.

Hon. Secretary: H. THOMSON, L.D.S. R.F.P.S. Glasg., H.D.D. R.C.S. Edin.
53, Portland Place, London, W.1.

Vol. III, No. 5 March, 1954

A SYMPOSIUM ON CALCULUS

THE BACTERIOLOGICAL ASPECT

By **ARTHUR BULLEID**, F.D.S., L.R.C.P., M.R.C.S.

Consultant Dental Surgeon to Guy's Hospital and Lecturer on Special Bacteriology to the Dental School

IT would appear likely that the factors concerned in calculus formation are both varied and complex and that there is no simple, single, explanation of its formation and deposition.

There still appears to be some doubt in many minds as to whether salivary and subgingival calculus are due to the same set of causes, though it does seem that the consensus of opinion suggests that at least they are closely allied.

My role this evening is to discuss the bacteriological aspect of calculus formation and deposition. There is at present no absolute proof that "tartar" formation is entirely the result of bacterial activity, though I think it is definitely an important factor in the problem.

In all probability there are other important factors, but how all tie up together is, in the light of our present knowledge, uncertain. It is agreed by most investigators that the micro-organisms most likely concerned in calculus formation are the "thread" organisms. It is recognized that in those mouths in which calculus of any description is absent that "thread" organisms are almost entirely absent, whereas in those mouths in which calculus formation, again of any type, is a marked feature, then "thread" organisms are markedly obtrusive.

Most of the "thread" organisms found in the mouth are part of the normal flora, and, as Morris (1951) points out, can be divided into certain genera as proved by their life cycles: (1) *Actinomyces*; (2) *Streptomyces*; (3) *Nocardia*; (4) *Leptotrichia*.

The *Actinomyces*, *Nocardia*, and *Leptotrichia* are undoubtedly normal mouth inhabitants

Fig. 1.—*Leptothrix buccalis.* Early stage in calculus production in pocket.

and probably the *Streptomyces* can also be included in this category, though by some they are thought to be accidental contaminants which have become adapted to the oral cavity. All these genera can be distinguished by their life cycles as described by Morris.

The *Nocardia* are aerobic or possibly microaerophilic. The *Actinomyces* are anaerobic but will grow in an atmosphere of 10 per cent

carbon dioxide under reduced oxygen tension —they cannot be cultivated under completely acrobic conditions. They pass through a life cycle which serves to distinguish them from the mould-like *Streptomyces*.

The *Leptotrichia*, first described by Trevisan in 1879, are a quite distinct genus from the other "thread" organisms found in the oral cavity. Their presence has been reported in the mouth at intervals from 1879 up to the present day. It is this genus which I personally think is of prime importance in this bacteriological story of calculus formation, as was suggested by Goodrich and Moseley in 1916.

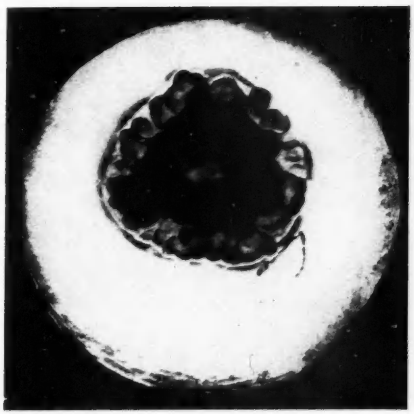


Fig. 2.—Colony of *Leptothrix buccalis* on saliva blood-agar.

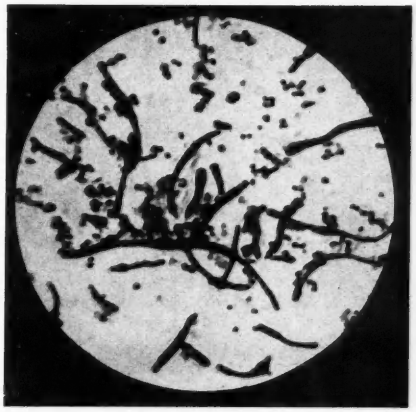


Fig. 3.—*Leptothrix buccalis*, showing marked "clubbing".

It is interesting, and I think instructive, to note that when smears are made from material scraped from the "tartar" ridges around teeth and in smears made from material around teeth in those areas in which calculus is so often discovered, such as the lingual aspect of lower anterior teeth or the buccal aspect of upper posterior teeth, then *Leptothrix* threads are always found in abundance (*Fig.* 1).

Many years ago Mr. J. G. Turner showed me sections of subgingival calculus which he had decalcified and they consisted entirely of *Leptothrix* mycelium.

In 1924 I was lucky enough to cultivate the *Leptothrix* from material scraped from the "tartar" ridge of an extracted upper wisdom tooth. I do not think it is necessary here to describe the morphology and cultural characteristics of the organism as they were fully reported in the Guy's Hospital Reports of October, 1924, and my observations have since been confirmed by Morris.

All I need say is that the organism differs morphologically from the other "thread" organisms in that the filaments are thicker than in any of the other genera and that branching is rarely seen (*Figs.* 2–5).

CALCIUM PRECIPITATION EXPERIMENTS

In a series of experiments I carried out I found that the leptothrix was able to precipitate insoluble calcium phosphate from a solution containing calcium and phosphate ions and I was able to demonstrate that this precipitating function was due to some property inherent in the organism and not to an exotoxin. I now know that it was the enzyme phosphatase which was responsible, and of all the organisms found in the mouth the *Leptothrix* produces more of this enzyme than any of the others.

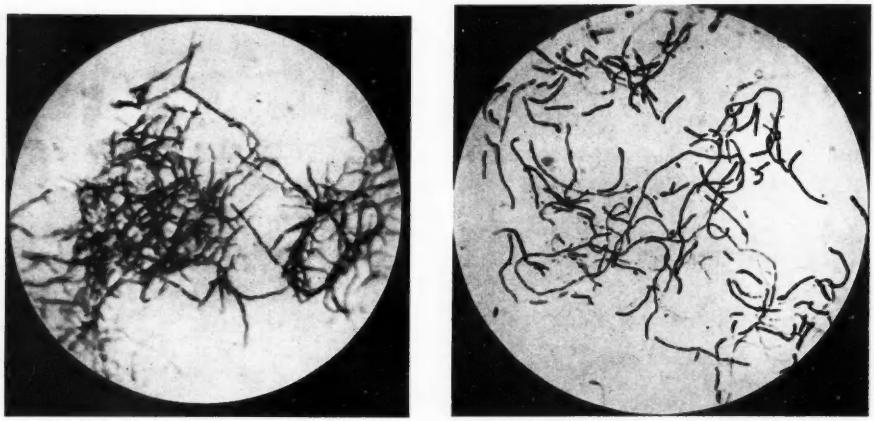
This series of experiments was carefully controlled, and in a parallel series using other mouth organisms such as *S. salivarius*, *N. catarrhalis*, and *Staph. aureus*, I was able to show that there was no precipitation of calcium.

ANIMAL EXPERIMENTS

In a series in which cats were employed an attempt was made to produce calculus around the teeth by a combination of mechanical injury plus the implantation of *Leptothrix* cultures. In the mouths of the cats used there was at least clinically no evidence of tartar, and in smears made from material removed from the gum margins only a very occasional filament of *Leptothrix* was observed.

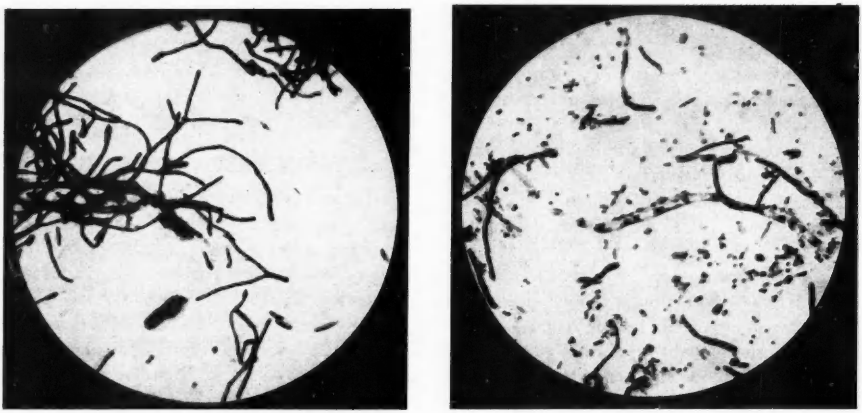
After reflection of the gum to a depth of $\frac{1}{4}$ in. under a general anæsthetic, cultures of the *Leptothrix* were introduced under the gum flaps, which were then closed.

Control cats in which the surgical interference of the gums was carried out, but in



A B

Fig. 4.—A, *Leptothrix buccalis*, note the interlacing of the filaments; B, Note the fusiform ends of some of the threads. The interlacing of the mycelium forms a "cushion" on which the calcium salts are deposited in tartar formation.



A B

Fig. 5.—A, *Leptothrix buccalis* showing branching; B, Note the hollow thread of the organism. A few coccoid bodies are still within the main sheath. The phosphatase content is high in these organisms. This organism is intimately connected with subgingival tartar formation.

which no culture of *Leptothrix* was introduced, were included in the series.

After about a period of three weeks a very small amount of calculus was detected clinically. A marginal gingivitis, the result of the surgical interference, was set up and this appeared to run *pari passu* with the calculus deposition.

The control cats showed no such deposition and the gums soon healed.

CONCLUSIONS

The marked adherence of the colony of the *Leptothrix* to the medium on which it is grown, the characteristic network of the mycelial filaments, the calcium precipitation, and animal experiments do seem to lend some support to the theory that the leptothrix is an active agent in the production of dental calculus.

Probably certain accessory factors are required for its unrestricted activity, and I am not in a position to be dogmatic nor do I claim that the bacteriological factor is more than one of the factors concerned.

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CLINICAL OBSERVATIONS

By **ARNOLD ROSENSTRAUCH**, D.M.D.

May I say in the first place how extraordinarily privileged I feel at having been asked to take part in this symposium. I am fully conscious of the fact that I have, though a mere amateur, undertaken this afternoon to join a team of specialists and, what is more, to address an audience of experts on their own subject. My interpretation of the task assigned to me will lead me to put before you, so to speak, the point of view of the consumer who struggles to keep abreast with your output and at the same time has his own reservations. With your permission I shall pose a number of questions for your consideration. I cannot presume to do more than hint at what answers, if any, I have in mind.

There exists widespread agreement that supragingival and subgingival tartar are fundamentally the same. Little significance is attached to the difference between them in rate of deposition, hardness, and colour. This is often explained as a mere byproduct of their respective localization.

At the chairside one is faced with the fact that, in spite of all statements to the contrary, two kinds of oral calculus exist, the behaviour of which, so far as periodontal disease is concerned, is entirely different. Often enough, I should say in most cases, both types of calculus appear in the same mouth and by their confluence suggest a picture of supragingival tartar advancing rootwards into the gingival crevice. However, there are numerous cases which form supragingival calculus and, even if left untreated for a long time, will not produce subgingival deposits. In these cases calculus may encroach upon the outer surface of the gingiva, and yet no pockets will be formed. And again, there are cases which form subgingival tartar and will, however long neglected, hardly produce supragingival deposits, unless subgingival calculus exposed by gum recession deserves that name.

It may also be relevant to note that the initial deposits of supragingival calculus are found opposite the orifices of the salivary ducts, while subgingival calculus will grow from little beginnings in the gingival crevice of any tooth, usually where the labial, buccal, or lingual surface of the root meets the interproximal surface.

The correct interpretation of these facts must be left to the research workers. Their reports on the subject of calculus have in the past been less detailed than one might have wished.

When we are told that the subgingival calculus is found only in cases of long-standing

inflammation (Emslie, 1953), one would like to know whether such a statement refers to microscopical evidence. Clinically it cannot really be confirmed. It is because of the absence of clinical symptoms of inflammation in the initial stages that subgingival calculus is so often overlooked until it has started to do its damage. As I see it, formation of subgingival tartar does not in its first phase have to depend on the presence of inflammation. Desquamated epithelial cells, shed in the normal process of tissue renewal and left to disintegrate in the cul-de-sac that is the gingival crevice, should be sufficient substrate for the tartar-producing elements to work upon, even before inflammation sets in.

Then there are the perplexing cases of pyorrhœa profunda. Many people present will have seen patients who have had this condition for a number of years and on their first visit present old X-ray films as proof. In spite of the absence of any previous treatment, they show no subgingival calculus where one would expect it most. Their history contradicts what has been said in explanation (Fish, 1944, 1952)—namely, that the development of the deep pockets present in these cases is too fast to give calculus time to form. One would wish it were as easy as that.

Another matter on which one would like our scientists' observations is the general impression one has that tartar production is uncommon among children, in my opinion before puberty. It may be merely owing to the difference in surface character between deciduous and permanent teeth. But in most cases the six-year molars have been present for a considerable time before we observe tartar on them, and the same applies to the lower incisors.

As an example of how we must guard against jumping to conclusions in these matters I would like to refer to a paper by Box (1942) which most people here probably know. Having given a very interesting account of his investigations into subgingival calculus, he refers to calculus, or rather its organic matrix, as inhibitor of caries. We can all confirm that no caries is ever found under accretions of calculus. It would be tempting, therefore, to conclude, as Box seems inclined to do, that abundance of calculus in the mouth implies protection against caries even beyond the immediate surface on which the calculus lies. There may well be only a limited correlation between cleanliness and caries incidence. But, whatever the truth about this or about caries pyorrhœa antagonism, caries and calculus can be and often are very good neighbours.

Let me add one further question: What is the relation between tartar formation on the one hand and saliva production or its relative absence on the other, for instance during sleep or as a result of experimental intervention? An answer to this would, I suggest, throw some further light on the problem.

As dentists we can only scale and scale again. In doing so we intervene in a vicious chain of cause and effect. Admittedly, we do not remove the cause of periodontal disease, but we maintain a balance which, when supported by home care, amounts, as nearly as at present possible, to periodontal health. Research may one day bring us a more fundamental answer to the problem. In the meantime we ought not to be discouraged in our work by those who decry the value of scalings. Nor ought the scaling operation to be considered as a mere appendix to dental treatment. The prevalence of periodontal disease is a reflection on the outlook of the dental profession.

When preparing this paper I made some inquiries regarding the instruction a dental student receives nowadays. It is not for me to advise on these matters. But I would be surprised if a student would remain indifferent, were he, by way of introduction, shown cases of advanced periodontal disease, and were he, after extraction of the teeth, given an opportunity of looking at the deposits on them, or, better still, asked to scale them off. His attitude to his patients and his approach to the subject would, I believe, be affected.

Finally, I would like to say one or two words about scaling as such. I was glad to hear Mr. Leatherman testify at one of the society's meetings that he finds it hardly ever possible to do a scaling without drawing blood. In the

hands of the average dentist this must be the rule. Needless to say, I do not advocate recklessness. On the other hand, an exaggerated fear of injury to the soft tissues would lead to incomplete scalings and invite, rather than avoid, the lateral periodontal abscess.

A scaling can be complete only if it is undertaken for such a number of teeth per session as one can deal with judiciously. It may be the whole mouth, and it may be only six teeth. (The snag is, of course, that you may clear everybody's pockets and not fill your own—but that is another matter.) An honest scaling must aim at a calculus-free mouth. I cannot see that this can be satisfactorily brought about by a division of labour between hygienists dealing with supragingival tartar and dentists operating below the gum margin. I am of the opinion that scaling above and below the gum margin is, or ought to be, part of one operation. It is the dentist's duty and should not be considered beneath his dignity.

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RECENT EXPERIMENTAL WORK

By **A. BRYAN WADE**, B.Ch.D., F.D.S. R.C.S.

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Only three reports of original investigations concerned with dental calculus have been published during the past three years. Two of these dealt with the method of attachment, one being with particular relation to prevention and the other to treatment. The third dealt with the way in which calculus accumulates.

Stewart (1952) worked on a hypothesis that mucins play a role in the attachment mechanism by providing an adherent film on the tooth surfaces in which crystals of calcific salts can be absorbed.

For his experiment he chose patients who appeared to accumulate calculus at a rapid rate. After an initial control period during which they continued with their normal hygiene habits and their usual dentifrice, a scaling and polishing was performed and the patients then given an ammoniated dentifrice containing 4·65 g. mucinase to 335 g. of powder (i.e., 1·38 per cent concentration). Recordings were made after a further lapse of time, the teeth were again cleaned, and a dentifrice was dispensed which was identical in all respects except that it contained twice the amount of enzyme. The experiment terminated with a further period of control using a dentifrice of the patients' own choice.

It was found that the calculus deposited was not only much softer, but was reduced in amount when the dentifrices containing mucinase were used (*Fig.* 1). The observations were completed on only three cases, according to the published report.

Stewart (1953) has, however, continued his experiments using a non-ammoniated dentifrice as the vehicle for the mucinase. He believes that liberated ammonia can pick up OH ions, thus increasing the hydrogen-ion concentration and tending to encourage calculus formation. The reduction in calculus deposition was greater than in his previous experiments.

I have myself investigated the possibilities of performing a more extensive trial of a dentifrice containing mucinase, but have found that the available sources of the enzyme appear to be from the *vibrio cholerœ* or bull semen. The former produces considerable hazards if these dangerous micro-organisms are to be used in quantity, whilst the latter is a source which is unlikely ever to be plentiful. In addition the storage life of a mucinase preparation is as short as three weeks, so it seems improbable that a mucinase-containing dentifrice will ever become a practical proposition.

Nevertheless Stewart's work does draw attention to the possible significance of the mucinous plaque as the essential precursor of calculus formation. If this is correct it would be an explanation of the fact that the heaviest calcific deposits are found on the lingual aspect of the mandibular incisor region, this being bathed by saliva containing the highest concentration of mucins.

An examination of the mechanical methods of attachment was conducted by Zander (1953), in which he was able to show that the organic matrix of calculus can be attached to the root surface by four different methods. It may be by means of the secondary cuticle (*Fig.* 2); by insertion into the minute spaces in the surface layers of the cementum which correspond to the previous location of Sharpey's fibres (*Fig.* 3); by the penetration of micro-organisms into the cementum (*Fig.* 4),

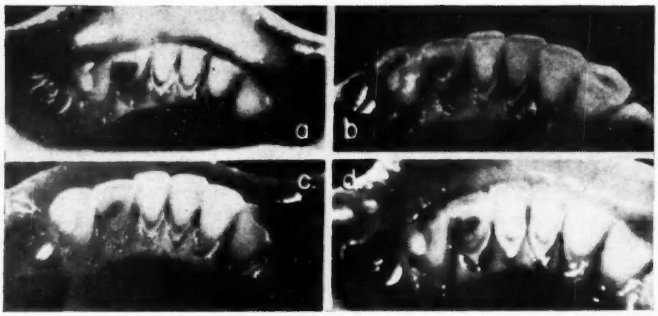

Fig. 1.—a, 42 days preliminary control. b, After using ammoniated dentifrice containing lower concentration of mucinase for 95 days. c, After using the dentrifice with the higher concentration for 135 days. d, 120 days after control using regular dentifrice. (*By courtesy of Dr. George G. Stewart.*)

Fig. 2.—Calculus attachment to secondary cuticle. A, Cementum; B, Cuticle; C, Calculus. (*By courtesy of Prof. Helmut A. Zander.*) (× 900.)

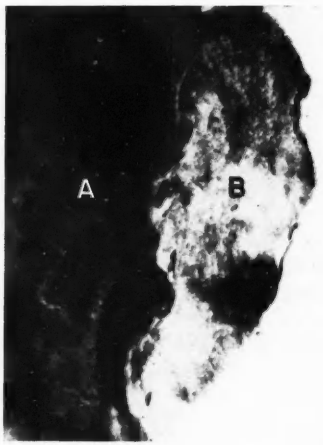

Fig. 3.—Calculus attachment to the irregularities of the cementum surface and into the spaces formerly occupied by Sharpey's fibres. A, Cementum; B, Calculus. (*By courtesy of Prof. Helmut A. Zander.*) (× 1000.)

or by deposition into areas from which cementum has been resorbed (*Fig.* 5). A combination on a single tooth of two or more

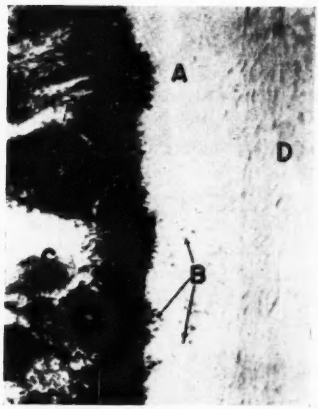

Fig. 4.—Calculus attachment by the penetration of micro-organisms into the cementum. A, Cementum; B, Micro-organisms; C, Calculus; D, Dentine. (*By courtesy of Prof. Helmut A. Zander.*) (×660.)

of these was frequently observed, that of the latter two being most common.

These different methods of attachment would account for the variation in the ease or difficulty which is encountered in the surgical

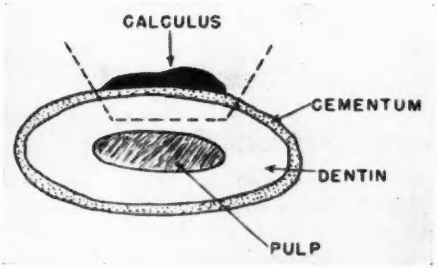

Fig. 6.—Method of obtaining specimen. (*By courtesy of Prof. Helmut A. Zander.*)

removal of calculus, for when the calculus is actually inserted into undercut resorption areas complete removal would be extremely difficult or even impossible without removal of some of the cementum. Calculus, if allowed to remain in an undercut, may well act as a nidus for further deposits, and so be a possible reason why deposits sometimes re-form rapidly after scaling has been performed. Zander's

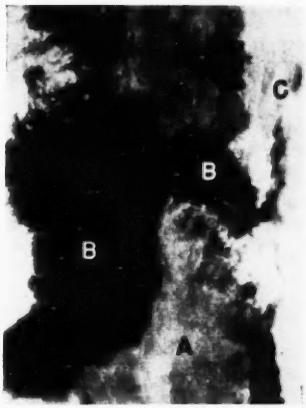

Fig. 5.—Calculus attachment into area of resorption in the cementum. A, Cementum; B, Calculus; C, Dentine. Micro-organisms are penetrating along the dentino-cemental junction. (*By courtesy of Prof. Helmut A. Zander.*) (× 660.)

work draws attention to the need for root planing ("curettage") as distinct from simple scaling.

In view of the excellence of the histological preparations upon which these findings were based it is interesting to note the method employed. Immediately after extraction of a tooth with gross calculus on its root surfaces, two transverse cuts were made with a double-sided diamond disk on either side of the calculus in order to obtain a piece of tooth (*Fig.* 6). This procedure was repeated on 50 teeth. Some specimens were fixed in Zenker-formol solution and decalcified in 10 per cent formic acid over a small amount of an ion-exchange resin (Dotti, Paparo, and Clarke, 1951). Others were prepared by a combined fixation and decalcification method, using formalin and trichloracetic acid. The specimens were embedded in celloidin, sectioned and stained with hæmatoxylin and eosin, and with a bacterial tissue stain.

Leung (1951) attempted to explain the uneven distribution of calculus in the mouth. It is a known fact that such substances as

powdered bone, powdered enamel, commercial tricalcium phosphate, and synthetic hydroxylapatite when added to saliva, result in the precipitation of relatively large amounts of calcium or calcium and phosphorus. Also chemical and X-ray diffraction analyses of calculus have shown that it consists of basic calcium phosphate arranged in a lattice structure of hydroxylapatite crystals. It would appear, therefore, that the natural hydroxylapatite found in the calculus could act as a catalyst producing further depositions of calcium and phosphorus when saliva containing these elements comes in contact with already deposited calculus. Leung considers that the reason why heavy incrustations are formed on the lingual aspect of the mandibular incisors is due to the fact that these surfaces are in close proximity to the openings of the salivary ducts and so saliva which contacts the already deposited calculus contains a higher proportion of calcium and phosphorus than the depleted saliva which passes on to other tooth surfaces.

Although the material presented is not strictly within the period of review, the publication of King (1954) is noteworthy, for it summarizes the vast amount of research upon dental calculus conducted by him. In this paper written so shortly before his death he asks four questions: (1) Are there any specific organisms or group of organisms which play a *direct* part in laying down calcified material? (2) Are organisms in the calculus-forming process of importance only as the source of a tooth-adherent organic matrix in which lime salts are deposited by other means? (3) What part, if any, do bacterial enzymes such as alkaline phosphatase play in the process? (4) Is calculus due to a combination of any of these processes?

If the answers to these questions can be found it might well be possible to advance far towards true periodontal prophylaxis.

I wish to express my gratitude to the Editor of the *Journal of Periodontology*, to Professor Zander, and to Dr. Stewart, for permission to reprint published work. The assistance afforded me by D. & W. Gibbs Ltd. and in particular Mr. H. Colin Davies, in my investigations of a mucinase dentifrice is also gratefully acknowledged, as are the services of my Secretary and the Photographic Department of the Royal Dental Hospital of London School of Dental Surgery.

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SYSTEMATIC METHOD OF DESIGNING UPPER PARTIAL-DENTURE BASES

THE design of any upper partial-denture base can be achieved by a 5-step procedure.

Step 1. *Outline of Saddles.* Buccally, saddles are extended to the limit of the mucobuccal fold in function. Palatally, extension is to the angle of intersection of the horizontal plane of the roof of the mouth and the inclined plane of the alveolar process.

Step 2. *Outline of Non-bearing Areas.* Areas to be avoided are (*a*) Lingual gingival tissue to a distance of 5 mm. from the necks of the teeth; (*b*) Torus palatinus; (*c*) Palatal tissue posterior to the vibrating line of the soft palate.

Step 3. *Outline of Bar Areas.* Areas not included in areas outlined in *Steps* 1, 2 are available for coverage by connecting bars.

Step 4. *Selection of Bar Type.* This is governed by:—(*a*) Mouth comfort; (*b*) Rigidity; (*c*) Saddle location; (*d*) Indirect retention. The relative importance of each factor is considered before the bar type is selected.

Step 5. *Manufacture.* This consists of joining the saddles with the selected bar type, bearing in mind the considerations outlined.—BLETTERFEIN, L. (1953), *J. Amer. dent. Ass.*, **46**, 510.

OFFICIAL SUPPLEMENT OF THE

SURGICAL INSTRUMENT MANUFACTURERS' ASSOCIATION (INC.)

DENTAL LABORATORIES SECTION

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Editorial Committee: D. M. BEAUCHAMP; H. J. POTTER, F.I.B.S.T.

EDITORIAL

PUBLICATION of ideals and aims is a worthy enterprise of any association, and particularly in the case of our own, whose branches are widely scattered over the country. Without such publication only a fraction of the members is able to gain knowledge of the issues with which it is necessary to deal, and thus intelligently to take an active part in the work.

There is no need in this last Supplement, nor is there space, to retrace details of the road we have travelled, but looking forward it is a safe prophecy that the youthful dental laboratory industry will grow, and sooner or later, as a result of this growth, it is bound to be disciplined by a tighter system of regulations, imposed both from without and within. The question remains: "Will the dental laboratories of Great Britain organize themselves quickly enough, so that numerical strength will command a louder voice in any future legislation affecting their business?"

We may congratulate ourselves upon the level of our ethical standards, quality of workmanship, and type of person our membership has attracted. We may also take satisfaction in the progress already made towards unity, and the good relations maintained with the dental profession. It is the hope of the association president and his committee that the efforts in the Supplement will have made the road ahead a simpler one to travel.

To the Editors and Publishers of the *Dental Practitioner*, whose good will has made possible for three years past the reporting of its activities and manifesto, the Dental Laboratories Section of S.I.M.A. says, "Thank you".

WEEK-END CONFERENCE DINNER

ASSEMBLING at the Holborn Restaurant on the evening of Friday, Feb. 12, members and their guests sent off the fifth annual function to a good start. Our President, with Mrs. Emmett, waited in the reception hall and graciously received all the diners as they arrived. We were honoured by the presence of our friends of the other Sections, and many guests, among whom were the Chairman of the National Joint Council, Mr. C. T. Youles, our legal adviser Mr. S. G. Davis, O.B.E., LL.B., and Dr. S. Gilbo, a dental surgeon from Oslo, with Mrs. Gilbo.

During the course of the dinner the toast of the guests was proposed by Mr. C. M. Booth with well-chosen words, and he called on M. Oosterbosch to reply. After expressing his joy at being present among those who followed the same calling, and conveying greetings from the Belgian association and the International Federation committee, M. Oosterbosch reminded his hearers of the need for an

association to protect our profession, and stressed that the services we render are of such value to dentists that they can no longer do without us, and that the existence of our craft is a result of progress, modern times requiring modern methods. He went on to say, "Why is it then that despite the great services we render, we are not given legal

Mr. and Mrs. Eric G. Emmett greet M. Jean Oosterbosch, Vice-President of the Belgian association, and provisional secretary of the International Federation of Dental Laboratories, on his arrival from Liege.

protection? One reason is that our esteemed practitioner clients fear we would press for advantages which would be to their detriment; yet we do not wish to take anything away from them.

"There is another means of obtaining protection for our profession. It consists in grouping our national unions on an international level, and in this federation becoming affiliated to the International Association of Independent Enterprises, Trades, and Crafts, a body officially recognized by the Economic and Social Council of the United Nations. There lies our salvation, for we would be in an environment similar to our own, where our problems would be understood, and our doctrine on an international level fully supported." His stirring speech concluded with a tribute to Sir Winston Churchill, and a challenge to Britannia in the persons of her dental laboratory owners to "go forward".

Mr. S. G. Davis complimented the former speaker on his eloquence and expressed thanks to his hosts, who in spite of troubles with dentures, indentures, and difficult times, extended such amazing hospitality to their guests.

Mr. C. T. Youles, toasting the association, referred to the pleasure he had in working with it, paid tribute to its work of education by means of lectures, demonstrations, exhibitions, and conferences, and said, "only by such shop window display of the highest standard can we gain a rightful recognition of our craft".

In his reply on behalf of the association Mr. Emmett was proud to preside for the fifth occasion over the only function in the country at which all spheres of the dental profession, surgeons, traders, technicians, and laboratory owners, meet in a happy social atmosphere. He thanked all who during the past year had contributed in any way to the successful working of the association, especially the much-travelled committee. With great pleasure he approached the high light of the evening, the presentation of a radio receiver to late Vice-President, Alex J. Grant, of Hove, Sussex, who with the co-operation of Mrs. Grant had been a prop of organized laboratories in these islands since the foundation was laid in 1930. He held the office since 1943, being now succeeded by Gerald E. Cross, of Birmingham, who owing to ill health was unable to take part in the presentation. He has been on the S.I.M.A. council of management since 1949, was a founder member, and later a Fellow of the Dental Section of the Institute of British Surgical Technicians; chairman for four years, and one of the panel of examiners. These were examples of his work entailing much time and travelling: a record for one man who is an old, serviced, and valued friend.

Adjourning to the ballroom with London chairman F. E. Martin officiating as master of ceremonies, dancing followed with intervals for refreshments and entertainment by Miss Joy Holman, soprano, until at midnight the festivities were ended by the singing of "Auld Lang Syne".

ANNUAL GENERAL MEETING

Held on Saturday, Feb. 13, at 11.0 a.m.

ABRIDGED CHAIRMAN'S REPORT

National Joint Council.—As one of the constituent bodies represented on the N.J.C. we have been able to secure modifications of the claims put forward by the employees' side and, after some compromise on both sides, new clauses governing the payment of wages during sickness and payment for holidays have now been adopted.

The constitution of the N.J.C. has been revised and issued in printed form and the wages and conditions of service which are subject to more frequent amendment, will be published as a separate booklet.

The council is now considering the revision of the N.J.C. model indenture, and certain proposals designed to safeguard our members were submitted to the N.J.C. Although it is unlikely that these will be accepted in their entirety, we hope that some concessions will be made which will be favourable to the employers.

Rules and procedure for the N.J.C. disputes committee have been formulated and a number of useful amendments were suggested by Mr. Davis which in the main have been adopted.

The committee has devoted a considerable amount of time and thought to the question of a more equitable grading of dental technicians, but the matter is in abeyance.

The Dentists Bill.—There have been no further developments in connexion with the Dentists Bill which has been in abeyance during the past year, but we understand that the Government intends to re-introduce it into Parliament at some future date. This matter is being carefully watched and suitable action will be taken at the appropriate time.

Denture Work for Hospitals.—Representations have been made to the Sheffield Regional Hospital Board concerning a proposal to establish a regional dental laboratory in Nottingham, in view of the fact that there are trade laboratories in the district which have adequate facilities for carrying out the denture work of the hospital in the region.

A protest has also been made to the Ministry of Health regarding a circular issued to hospitals in the West of England advising them that their denture work could be undertaken by a Health Centre at certain specified prices. In view of the uneconomic charges quoted, with which our members could not possibly compete, and the fact that the work at the Health Centre is subsidized from public funds, the matter was taken up with the Ministry of Health and in view of their unsatisfactory reply we are continuing to pursue the subject. The matter was also brought to the notice of the B.D.A. but we have been unable to obtain any support for our action in that quarter.

Standardization.—A draft B.S. Specification has now been produced for acrylic resin denture base. This has been approved by the committee, who feel that a useful start has been made in the standardization of dental materials.

Overseas Contacts.—During the year we have had exchanges of views with representatives of the Swiss and Israel Laboratories Associations, and have maintained correspondence with the N.A.D.L. of U.S.A.

Members of the French association visited this country to attend our conference last February, and similar meetings were arranged in Paris last May to which various national associations were invited with a view to establishing an international federation. We felt that S.I.M.A. should participate and Mr. Beauchamp attended as our delegate (accompanied by Mr. and Mrs. Spencer), taking with him a comprehensive display of British prosthetic craftsmanship for the exhibition held in conjunction with the conference. As a result we may consider our organization together with those of France, Belgium, and Italy, to be founder members of the International Federation of Dental Laboratories. Among other achievements was the foundation of a journal to appear in French and English

every two months for the purpose of exchange of information. Through our delegate we have already made our contribution to the first issue, the cost of which is being borne by the Italians, and in your name I thank him for his efforts on our behalf, knowing you will all agree that a great country like ours must keep well to the fore.

Publicity.—There have been a number of demonstrations and lectures throughout Great Britain sponsored by the various branches, at which all spheres of the profession were represented. These have been organized at little cost to our funds, but have been of considerable value to S.I.M.A.

Arising out of the various local conferences which have been held throughout the country it has been decided to hold a summer conference under the auspices of S.I.M.A. in a different area each year. This year it will take place at the Chamber of Commerce, Birmingham, on Saturday, June 19, by invitation of the Birmingham Branch. Full details will be circulated to members later, and it is hoped that all branches will support this effort.

Education.—A number of our members continue to act upon Regional Educational Advisory Committees and as Instructors at the various Colleges, and also as examiners for the City and Guilds of London Institute.

The question of an award to the best student in the City and Guilds examinations throughout the country has been discussed on several occasions, and after reference to the branches for the views of their members, it has been agreed that a prize to the value of £3 10s. should be awarded to the best student in the City and Guilds examination each year on behalf of S.I.M.A. The presentation will as far as possible be arranged to take place in the area in which the successful student resides.

There have been some misgivings at the number of failures in the City and Guilds examinations, and the representatives on the N.J.C. have been asked to bring to the notice of their constituent bodies the commitments involved in taking on apprentices. Members are therefore asked to exercise every care in the selection of apprentices to ensure that in addition to their aptitude for the work in the laboratory their educational background is such as to enable them to assimilate the theoretical knowledge required for the successful completion of the City and Guilds course. It is also incumbent upon employers to allow their apprentices to attend daytime classes for one whole day or two half days per week. It must be remembered that this is one of the conditions for deferment.

EXHIBITION OF DENTAL LABORATORY EQUIPMENT AND TECHNIQUES

SATURDAY, FEB. 13, AT 2.30 p.m.

OPENING the exhibition, Mr. Emmett welcomed all present who had taken the opportunity to increase their knowledge, so as to maintain a high standard of work for the public we serve through the dental profession.

The Amalgamated Dental Co. had an interesting historical view of artificial teeth; articulated specimens of set-up technique.

The S. S. White Co. of Great Britain: An array of tools for the laboratory; Virilium technique and vibrator.

Dental Fillings Ltd.: Simplex Simplified self-curing repair material; Acrifix cement.

Claudius Ash, Sons and Co.: Gold metal work; General requirements for dental laboratories.

Baker Platinum Ltd.: A range of gold and platinum wires, casting alloys, investments, and advice for those in difficulties.

Cottrell and Co.: Practical demonstration of Nu Life cold-curing acrylic for repairs and dentures.

Norman Rayne Ltd.: The dead-hard steel taper chucks for all motors, about the permanence of which many appreciative remarks were heard.

Dental Manufacturing Co.: Tungsten carbide abrasive instruments; an excellent range of dental waxes; Dentacryl teeth.

Henry Courtin and Sons: A new low-voltage porcelain furnace; Swedon cold-curing acrylic; Svedion chrome cobalt; plastic patterns.

Dental Repairs and Renovations Ltd.: Specializing in rebuilt motors they offered advice on upkeep; showed motor armatures and field coils.

Davis, Schottlander and Davis Ltd.: Croform technique; investments; Vibrator and other accessories.

The encouraging attendance of approximately three hundred and fifty, some from Nottingham, Birmingham, and Coventry, non-member E. A. Schoolden from Glossop (with co-author F. G. Shaw) from whose pen informative articles continue to flow, all interested in the tables, all meeting old friends, all making new acquaintances, proved once again the value and pleasure of such gatherings.

The exhibition was closed at 5 p.m. by our President, who referred to our debt to the organizer for his able handling of the whole of of the week-end conference, and expressed thanks for their valued co-operation to the members of the Association of Dental Manufacturers and Traders.

PERSONALIA

It is very fitting that in this last issue we should express sincere thanks to those who have in any way contributed to the production of the Supplement, especially to Mr. C. M. Booth and Mr. H. J. Potter, who, with Mr. Emmett, planned and were responsible for its appearance.

Mr. and Mrs. Booth and Mr. and Mrs. Potter caught by the camera in happy surroundings.

Born in Sheffield, Mr. Booth has spent most of his life in London, and was educated at the Edmonton Latymer School. Immediately after completing an indentured apprenticeship with T. W. Widdowson, Esq., F.D.S., he started in business in North London, thus displaying an energy of mind the impetus of which has made him a key man of our activities—the first S.I.M.A. film show in Friends' House; table demonstrations at the Bonnington Hotel and Holborn Restaurant; the five annual week-end conferences, comprising dinner, dance, annual general meeting, and Saturday afternoon attraction, compel admiration of his organizing ability.

Mr. Potter was the son of a regular army veterinary surgeon, and spent his childhood in travel abroad and at home. The time of his leaving school coincided with his father's retirement, and he was apprenticed to a local dentist, later joining Mr. H. Netherton in his

laboratory to the profession, a move which commenced a happy and instructive sojourn.

At the outbreak of war he volunteered for the R.A.F. as a dental technician, and attained the rank of sergeant. Demobilized, he opened his laboratory in Luton, having valuable encouragement and help from his wife, and he has recently been joined by his son, Richard.

He is a Fellow of the Institute of British Surgical Technicians, and serves on the education committee; he was the first chairman of both the Provincial Dental Technicians' Study Club and the committee responsible for instituting courses for technicians at the Bedford College of Further Education.

Both these stalwarts have already given good service on the main committee, and have done far more than their share of work for a well-organized association embracing all ethical laboratories throughout the country.

S.I.M.A. DIARY

First International Dental Technicians' Congress, and General Assembly of the International Federation of Dental Laboratories, by the invitation of the Sindacato Nationale Odontotecnici in the enclosure of the Milan Fair, April 24–28. Scientific and Cultural Relations; Technical Demonstrations; Materials Exhibition; International Contest of Prosthetic Craftsmanship.

Third Conference, Saturday, June 19, Chamber of Commerce, New Street, Birmingham. 11 a.m., Conference; 1 p.m., Luncheon; 2.30 p.m., Film illustrated lectures on Investments, Vacuum Investing, and Hygroscopic Expansion, and Acrylic Eye Implants. Admission cards from Hon. Sec., George Taylor, F.I.B.S.T., 310, Ridgacre Road, Quinton.

Fourth Summer Conference, 1955. This will take place in Bristol.

INSTITUTE OF BRITISH SURGICAL TECHNICIANS (INC.)

Dental Section Lectures

An appreciative audience listened with interest to a discourse by Mr. C. T. Youles, Chief Technician at the Eastman Dental Hospital, on "Immediate Dentures" on Jan. 19, under the Chairmanship of Mr. J. R. Boswell.

This followed, and was linked up with, a lecture by Mr. J. H. Lee, L.D.S., D.D.S., of the Eastman Dental Hospital, given last November, dealing with the clinical aspect of the subject.

After defining immediate denture procedure as the construction of dentures before all the remaining teeth have been removed, and the insertion of dentures immediately following the removal of the remaining teeth, Mr. Youles indicated the advantages of the immediate denture technique. He followed this with a description of the methods employed from the taking of the impression, the preparation of the teeth, the advantage of gum alveolectomy in preference to the socketing method, the careful matching of the natural gum, and the desirability of avoiding too drastic a re-positioning of the original teeth.

The lecturer then dealt very adequately with the method of construction in the laboratory, describing the processes from the duplication of the primary impression, through the various stages of fabrication, including the reproduction of the teeth, making gum slips, staining and colouring, etc., to the waxing up, flask, pack, and finish of the completed denture.

Questions were answered in detail by Mr. Youles.

Much interest was shown in the specimens of immediate dentures, incorporating alveolectomy, which were available for inspection after the lecture.

A lecture will be given by Mr. John W. McLean, L.D.S. R.C.S., on "Heat-cured and Self-curing Acrylic Resins in Prosthetic Dentistry" on Tuesday, April 20, at 6.30 p.m., at the Eastman Dental Hospital, Gray's Inn Road, W.C.1.

Admission tickets are obtainable on sending stamped addressed envelope to the Institute, or through members.